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Session: Comment répondre à des besoins et des objectifs à des échelles politiques sociales environnementales

Abstract:

In sub-sahelian Africa, fuelwood is the main source of energy. Managing fuelwood involves various objectives such as avoiding over-exploitation of dry forest resources and supplying fuelwood to urban consumers and rural population. Polices have been designed in Niger in the early 90’s to match these two objectives. They faced a complex system dealing with the resource and its changes, the exploitation practices and the livelihoods at local level, the fuelwood trade networks and the consumption needs. Because these policies are challenged by the debate on the choice of environmental policies and by the World Bank’s analysis on their lack of efficiency, there is a need to analyze their effects.

Conceptual modeling was done to understand the conditions of implementation of the policies used to regulate exploitation of fuelwood in the peripheral zone of the Niamey city. The conceptual modeling was carried out through interdisciplinary research team meetings, and through surveys of farmers, traders and forest administration agents. The fuelwood system was divided in subsystems that represent the various scales of intervention covered by the policy: the farmers’ harvests at the scale of village dry forests according to the policy rules, the traders’ decision making to arbitrate between the various villages forests supply, and the whole fuelwood supply system to Niamey city.

According to the conceptual model, a first MAS model was done to represent the subsystems and their interactions with the ecological dynamics (forest resources and rainfall conditions). It was used to explore the key features and the effects of the policy rules. Graduate taxes on fuelwood trade, zoning and global harvest quotas, technical harvest rules, institutions such as rural markets of fuelwood were studied.
Building this first model pointed out key variables at each scale of policy intervention to be tested in a new companion modeling approach in a second phase. The key variables are related to the level of compliance to and the control of the policy rules, the inappropriate definition of taxes and quotas according to the demand of trade, and the harvesters’ adaptation to access rules. The model helped firstly to consider the various scales of policy implementation and secondly to assess how the results of the policy are to be affected by the interactions between social and ecological dynamics at each of these scales.